Lake Michigan discussion
October 7th, 2004
State of the Lake Ecosystem Conference

Ric Lawson- Great Lakes Commission presentation on coastal wetlands:

- Conditions of wetlands in L Michigan and biotic indicators and the stressors present. Areas estmitates-1/2 of total wetlands are located in Lake Huron and Lake Michigan, the majority are barrier protected and river-mouth type wetlands.
- Barrier wetlands are predominantly located along the northern shore of the lake, Upper and Southern Green Bay.
- Potential plant metrics- floristic quality index or Conservatism Index most effective; percent cover of exotic species gives good picture of disturbed wetlands; many metrics are only effective in specific regions; water level changes reduce effectiveness of many plant metrics.
- IBI scores for Downed River plant communities show degree of disturbance of plant communities not grouped according to size but show patterns of disturbance and land use.
- Invertebrate and fish based IBIs for coastal wetlands: disturbance gradient shows south more disturbed and north being less disturbed.
- What Metrics match up with the observed gradient? Manistee shows good results. Kalamazoo shows certain types of invertebrates illustrating its relative disturbance and relative abundance of certain types of invertebrates and habitat preferences. Potential indicator fish species- spottail shiner, black bulhead, green sunfish. Bird and amphibian indicator species- IBI measures richness, foraging, nesting, species, etc. ..
- Possible stressors on these systems: hydrological alteration, sedimentation, chemical inputs, shoreline alteration, dyking, dams, invasive species are secondary stressors. In healthy systems not many invasive species- more symptoms of the problem.
- Residential stressor shows high percent of total wetland area is affected. Roads affect 96% of all wetlands. Dredging is also impacting wetlands. Even northern wetlands are being affected by these stressors.
- Agricultural, urban systems drive the biology in wetlands. Chemical inputs have significant negative relationship with the biological state of the wetlands.
- Monitoring is the next step after preliminary results.

Great Lakes Coastal Program-US Fish and Wildlife presentation:

- Emphasizing partnerships
- Different ecotypes
- Provide Grant money for projects
- Examples of projects:

    - St. Louis river habitat plan-focus on restoration, invasive species and education (Locally led leveraging project)
    - Kakogon Slough Rail survey- recapture and mark
    - Graveyard Creek Restoration- fish passage restored and stream rehabilitated
    - Belle Isle Restorations- coastal wetland restoration, native plant census, soft shoreline engineering demo
    - Grand Sable Dune exotic plant management- mapping and removal of exotic plants
    - Lakeplain Prairie restoration- fringed orchid reestablishment and 10 year monitoring plan
- Summary:
    - Developed Non-regulatory partnership approach
    - Great Benefit to coastal communities and near shore, shoreline, riparian and in-stream and removed fish barriers.
    - Many project successes.
    - Granting issues- compilation of granting opportunities needed
    - Track/monitoring success of projects on longer term changes over time. Database available of projects-"Habits".

Lake Michigan mass balance modelling project:

- Monitor: arsine, mercury, and PCB
- Low to high resolution models
- Arsine shows little degradation and predict that levels will increase.
- PCBs model predicts in water, sediment and up food chain- concentrations will decline
- Mercury- low screen model shows little methylation in lake, methyl m is coming from tributaries.
- 1994, 1995 and 2005: Plan on revisiting sampling sites and gathering more data. 2005 sampling will provide opportunity to Check reality of model forecast to tune models

Discussion:

Vision or goal

- NOAA Coastal zone management program in Indiana offers 1million $ per year in grants for research projects.
    - "CELCP" (coastal estuarine land conservation program) plan what should be preserved in each state- planning document.
    - Each state will develop a plan for areas that are unique for that state.

    - US Fish and Wildlife will identify critical habitat types to create model for Indiana and transportation plan.
    - Public access component- public property for land acquisition.
    - Rare for federal government to acquire land but do through this program.
- Proposition: Conservation Fund should acquire more Great Lakes islands etc…
- Need more money from federal government for Lake Michigan and land acquisitions.
    - Proposal put in to federal government for similar funding for Great Lakes like there is for everglades. Difficult to access federal funds.
- Pull together Great Lakes commission coastal wetlands data, CELCP plans and other to create a better overarching vision and strategy.
- Tribes have delineated and prioritized coastal wetland areas.

What exists now and R&D?

- Significant Groundwater and recharge areas- groundwater basins and aquifer delineation needs more work. Some significant recharge areas have been delineated by USGS in Great Lakes area: estimate of recharge vary from 0-23 inches range; presently working on extrapolating data to entire basin.
    - Is the recharge being impacted? Don't have enough for trend data but near future will be able to do that.
    - Land use is not yet being considered.
    - Withdrawal rate data needed- very important.
    - Recharge does not equal sustainability. Need social consensus on sustainability (quality and quantity) of the system, scientific data can only provide information for decision making. Quality and quantity need to be discussed.
    - Commission- characterizing, water use database. Water use Data summarized by state, need to be done for Lake Michigan basin. Report exists (commission) - Water use correlated to biological system state. Just scratching the surface.
    - Conference in Chicago in Feb. on water use.
- Need to focus on pre-emptive not remedial. More information exists on damaged systems than natural systems.
- Need for consistent, recent collection of aerial imagery of the Great Lakes basin.
    - Agencies capable of providing data: NASA, NOAA, Great Lakes observation system.
    - Coast watch provide remote sensing data.
    - Michigan sea grant- use water temperature to make contour maps for lake.
    - Landsat provides land characterization- but not really useful for coastal areas because scale too big. $ issue for Landsat data availability
    - Indiana has ortho photos- communities have option to buy to 1m.
    - Need to be done for entire coastline!

    - Need to create specific grant program for project.
    - Need to push from different angles to create momentum.
    - Lydar (2006) – laser technology, high resolution for elevation info. Difficult to analyse but could be very useful.
    - NOAA is suggesting great lakes survey services- technical assistance for local projects.
- Data exchange
    - Need to be in sync for all existing data for communication.
    - Need to optimize existing data.
    - Bring data together from different states and then pull it down to watershed and local level.
    - Info needs to be reformatted and user friendly or software accessible-right scale, date etc..
    - Metadata works well.
    - Local groups don't have funds for data.
    - Need appropriate funding mechanism.

What preserve, restore, how to prioritize?

- Numbers may be misleading about the actual ecological state and health.
- Accuracy of data, systems are dynamic they change so wee need to monitor change.
- Time for monitoring is very relevant.
- Fly over may provide data to show how systems are changing and their state throughout time.
- Need to distinguish native and invasive species.
- Establish as baseline of quality and quantity and relate it to stress and degradation and overtime check on restorative areas and see how systems changes.